Why Do States Build Walls?

Political Economy, Security, and Border Stability*

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April 5, 2015

Word Count: 11,436

Abstract

Borders constitute the international system of states. Accordingly, states will, from time to time, take assertive measures to secure the border, with among the most aggressive strategies being the construction of physical barriers, which we refer to as "border walls". Using original data on man-made border wall construction from 1800 to 2013, we theorize and find that in many cases wall construction is about economic-security. Significant economic disparities between the states will create incentives to illegally transport people or move goods readily available in the poorer country but highly regulated in the richer country. We find that economic disparities have a substantial and significant impact on the presence of a physical wall that is independent of formal border disputes and concerns over instability from civil wars in neighbors. In other words, the prominent example of the Maginot Line, constructed largely out of fear of attack, is an exception, not the exemplar, of the reasons states construct border walls.

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*We thank Christina Bodea, Rafaela Dancygier, Mark Fey, Joanne Gowa, Doug Gibler, Hein Goemans, Kelly Kadera, Evan Lieberman, Michael McKoy, and Mark Souza, for helpful comments on prior versions of this paper. Any mistakes remain our responsibility.

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1 Introduction

Borders constitute the international system of states. In principle, borders clearly and efficiently demarcate a shift in the jurisdictional responsibilities of states. Despite claims that transnational political and economic processes are rendering borders obsolete, border management remains highly relevant. Borders can fail in their constitutive function. First, there exist territorial disputes over the demarcation of borders. A massive literature convincingly demonstrates profound consequences for patterns of conflict and cooperation when border location is disputed. Second, leaders and citizens worry about illegal immigration, drug trafficking, and refugee flows (Naim, 2005). But unlike the first source of instability, the international relations literature has paid little attention to the instability from unwanted cross-border flows and the policies states implement to regulate such flows.

States experiencing difficulties regulating the cross-border flow of goods and people sometimes take aggressive measures to secure the border, with among the most aggressive strategies being the construction of physical barriers, which we refer to as "border walls".[1] Based on original data that we describe below, there are 62 unique instances of man-made border walls from 1800 to 2014. Some of these walls, such as the Berlin Wall separating East Berlin from West Berlin during the Cold War or the Maginot Line between France and Germany during the 1930s, are quite famous. Others are more obscure, such as the Morice Line between French-Algeria and Tunisia from 1957 to 1962. However, well-known historical examples can obfuscate an important fact: out of the 62 total man-made border walls constructed since 1800, 28 have been constructed since 2000.[2] Thus, this aggressive state strategy to manage border instability is on the rise, not in decline.

What explains the construction of border walls, particularly since not all states choose to pursue this policy? Building a wall is a major undertaking, but may be more attractive to leaders than the perceived alternatives. Following Soviet construction of the Berlin Wall, President Kennedy remarked that for all of its flaws and drawbacks, "A wall is a hell of a lot better than a war"

[1] As we note below, not all of these barriers constitute a proper concrete wall. Some are instead a series of posts, obstacles, and fences. However, the term "wall" allows for consistency and clarity in our presentation.

[2] For a similar pattern using data from 1945, see Hassner and Wittenberg (2015).

(Quoted in Gaddis 2005, 115). It is also plausible that walls are at times erected to stem the flow of refugees fleeing a civil war in a neighboring state. Building a wall is plausible as an alternative to directly intervening in a neighbor's civil war. Additionally, as in the case of the Maginot line, a wall might be viewed as a cost-effective defensive measure intended to deter aggression by increasing the costs and difficulty of attack (even if, in the case of the Maginot line, it ultimately failed).

While such military-security explanations are reasonable, we argue that in many cases wall construction is about economic-security. Wall construction is explained by cross-border economic disparities. Significant economic disparities between states creates incentives to illegally transport people or move goods readily available in the poorer country but highly regulated and relatively expensive in the richer country. We find that economic disparities have a substantial and significant effect on the presence of a physical wall that is independent of formal border disputes and concerns over instability from civil wars in neighbors. In other words, the prominent example of the Maginot Line, constructed largely out of fear of attack, is an exception, not the exemplar, of the reasons states construct border walls. While this point has been suggested (e.g., Rosière and Jones 2012), the small but growing literature on border walls lacks a systematic test of the role cross-border economic disparities or military threat play in the emergence of border walls at specific points in two neighbors' relations.

By forwarding an explanation for the construction of walls and a systematic test, we offer important contributions to several literatures. First, while numerous studies highlight the importance of borders for inter-state military conflict (Luard, 1986; Holsti, 1991; Vasquez, 1993; Kocs, 1995; Vasquez, 1995; Hensel, 2000; Vasquez, 2000; Senese, 2005; Mitchell, 2002; Huth and Allee, 2002*a*; James, Park and Choi, 2006; Mitchell and Hensel, 2007; Huth, Croco and Appel, 2011), trade (Simmons, 2005), and the onset and duration of civil wars (Salehyan, 2007; Gleditsch, Salehyan and Schultz, 2008), few studies consider border instability that derives from economic concerns.[3] Being systematically violated by a subset of the population, an unstable border produces negative externalities for both states. At the extreme, efforts to control these externalities can lead to a "militarization" of the border through generally increasing involvement of states' militaries in

[3]One exception is Gavrilis (2008), who argues that empowering local officials facilitates effective border management and stability.

border management. Second and related, the conflict literature is rich with studies of territorial disputes (Kocs, 1995; Huth, 1996; Hensel, 2001; Huth and Allee, 2002*b*; Gibler, 2007; Tir, 2003; Senese, 2005; Vasquez, 1995), but the management of border function is an issue in need of attention. Border stability, or how well international borders *function*, is viewed as being increasingly important to international relations.[4] Finally, while there are a few studies of border walls, existing studies either do not systematically test alternative arguments (Rosière and Jones, 2012), or have a cross-sectional focus (Hassner and Wittenberg, 2015). While cross-sectional designs provide much insight and explain how relatively time-invariant variables such as the religious compositions neighboring states affect wall-building, they cannot explain how economic variables affect the timing of wall-building given that economic disparities have long existed between neighbors such as the U.S. and Mexico, but border walls have become much more common only since the end of the Cold War. Our paper is the first to systematically test how *changes* across time in neighbors' relations are associated with the emergence and maintenance of border walls.

The remainder of the paper is as follows. First, we outline our political economy theory of wall construction. We argue that large economic inequalities between the two states sharing a border can lead to walls. Next, we outline two prominent alternative logics that can explain why states build walls. Third, we describe our new data on border walls and outline the rest of our data and our research design. Fourth, we describe our empirical results. Finally, we conclude and offer suggestions for future research.

2 A Political-Economy Explanation of Walls

What explains why and when states construct border walls? While border instability can be brought about by factors ranging from illicit migrations to the threat of a neighbor's invasion, border wall construction is very often, though not exclusively, about economic-security (i.e. the prevention of economically motivated immigrants), as opposed to military-security (i.e. prevention of invading forces or terrorist attacks). To present this argument, we begin by defining our core concepts of borders and border stability. Next, we explain how economic disparities lead to border

[4]For a good discussion of the distinction between function and location, see Gavrilis (2008) or Atzili (2012, 13).

instability. We then explain how states respond to economically induced border instability with wall construction. The final parts of this section discuss alternative mechanisms for border instability and wall construction: civil wars and military threat.

Border Stability: Prevention of Negative Externalities

Stable borders clearly and efficiently demarcate a shift in the jurisdictional responsibilities of the states sharing the relevant boundary. This is accomplished when the border's jurisdictional rules are both widely recognized by and incentive compatible with the population at large. In other words, stable borders are demarcations that the populations on both sides recognize and (for the most part) honor. A border is unstable if its integrity is systematically violated by a subset of the population, thereby producing negative externalities for both states. Thus, echoing Rudolph (2003), an unstable border represents a leaking or perforated border where a significant proportion of flows across it are unwanted by at least one state.

The extant literature concentrates on uncertainty over the effects of borders, as Simmons (2005) focuses on border disputes creating economic uncertainty and Carter and Goemans (2011) focus on how variation in the drawing of boundaries affects leaders' uncertainty over the boundaries' security implications. This literature has not as clearly emphasized that borders are effective institutions when they create jurisdictions that are consistent with the incentives of those affected. In other words, problems with the incentive compatibility of jurisdictional rules implied by international borders need not be about uncertainty.

Ideally, a boundary cleanly marks the transition from one state's jurisdiction over economic, political, and security issues to a second state's authority. However, in many cases, this jurisdictional transition is not seamless (Brown, 2010). In some cases, ineffective borders are formally disputed by the states that share them (Huth, 1996), but negative externalities often arise from borders that are not formally disputed (Gavrilis, 2008). For instance, while the border between India and Bangladesh is not in dispute, India claims that militants have been trafficking weapons into northeast India along the border (Donaldson, 2005, 186). Similarly, the border between Pakistan and Afghanistan produces negative security externalities for Afghanistan as its permeability facilitates insurgent attacks (Schultz, 2010). What factors lead borders to become unstable and produce such

negative externalities? We now explain how economic factors lead to border instability.

Cross-Border Inequality and Border Instability

Consider the standard neo-classical model of an economy. In this model, countries with large endowments of labor relative to capital have relatively low wages, while those with limited endowments of labor relative to capital have relatively high wages (Krugman and Obstfeld, 2005, 149–151). This suggests two related mechanisms by which cross-border economic inequality promotes border instability: (1) wage differentials create incentives for illegal migration, and (2) sharp price differentials create incentives to smuggle black market goods.

For the first mechanism, the differential in wages between the two countries incentivizes workers in the low-wage country to move to the high-wage country. Individuals conduct a cost-benefit analysis and decide that the benefits of migration (higher wages) are worth the costs. Theoretically, economists have noted that open trade should help equalize prices and reduce this dynamic (Samuelson, 1948; Mundell, 1957). In practice, trade has not had this effect, as sharp differentials in prices still exist among states, even those that border and trade relatively intensively with each other (Balassa, 1964; Samuelson, 1964; Bhagwati, 1984). Massey, Durand and Malone (2002, 9–12) argue that members of a household hedge risk and diversify their labor "portfolio" by sending only one or two members to the high-wage destination. These workers, in turn, remit wages back home. If such differences are sufficiently large, then an individual's (or family's) cost-benefit calculation will deem the expected earnings to be worth entering the high-wage country illegally if legal entry is not available.

The second mechanism relates to the movement of goods. Differences in incomes, brought about by differences in factor endowments, lead to differences between localities in the prices of non-tradable goods (Krugman and Obstfeld, 2005, 387–388). Some goods are not tradable because they rely on locality specific factors. But other goods are non-tradable because they are prohibited in one or both countries. Such prohibitions create black markets and, therefore, incentivize individuals to seek ways to bring such goods into the higher price region and, minus the transaction costs, receive a healthy profit (Parkin, 2005, 124). As Naim (2005, 82) observed in his study of illicit global trade, "[b]orders to dodge, raids to evade, and bribes to pay out are all integrated into the cost of doing

business, raising prices and profit potential." For instance, the smuggling of black market goods into Turkey from Iraq is quite common, as it is much more profitable to sell in Turkey, with a GDP per capita of just under $15,000 in 2011, than in Iraq, with a GDP per capita of just under $4,000 in 2011.[5] Furthermore, the smuggling of black market goods from Iraq into Turkey contributes significantly to instability at this undisputed border. The culmination of this instability was the "accidental massacre" at the border village of Uludere on December 28, 2011, in which the Turkish government bombed and killed 34 smugglers who were mistakenly thought to be insurgents.[6]

In short, the economic incentives of the populations on both sides of the border are key to understanding border stability. The state of the economy and the level of development in each country fundamentally shape economic incentives at the micro-level. Neighbors with roughly similar levels of economic development are unlikely to experience economically induced border instability. Illicit activity is associated with risks and costs for individuals, which are less likely to be worthwhile if the level of economic opportunity within one's own country is comparable to what can be gained across the border. Rather, since economic disparity creates numerous opportunities for cross-border profit, neighboring countries exhibiting stark difference in levels of economic development are likely to have an unstable border.

Consider the borders of North America. The relative congruity of economic development between the U.S. and Canada is important for understanding the stability of that border, despite it's massive length. It is not the case that a large number of Canadians are striving to come south to work in the U.S. because wages and the standard of living are considerably higher (Pellerin, 2005). In contrast, with the U.S. being substantially more economically developed than its southern neighbor, Mexico, this inequality generates periodic streams of illegal immigration, as individuals skirt border controls in search of a better economic situation in the U.S. Additionally, the demand for illegal drugs in the United States, coupled with a natural supply route from South and Central American growers through Mexico, produces a stream of illegal drugs crossing the border. The relatively high price of drugs in the U.S. makes this a particularly lucrative trade (Andreas, 2000). As Pellerin (2005, 57) argues, the U.S.-Mexican border "has long been the object of police surveillance"

[5]GDP per capita figures are obtained from Central Intelligence Agency (2012).

[6]See *The Economist*, June 9, 2012: `http://www.economist.com/node/21556616`.

largely because of "wage and social differentials" between the two countries.

Border Instability and Wall Construction

Walls are nearly always built because at least one of the states perceives its border as unstable. The economic incentives of the populations on both sides of the border are key to understanding border stability and, by extension, border wall construction. When economic disparities induce border instability, meaning the border is systematically violated by a subset of the cross border population, states will take steps to bolster the border.

A particularly aggressive strategy for addressing such border instability is to construct a physical border wall. A border wall is a relatively extreme example of a "top-down" strategy of border management by the building state. Moreover, building a wall is almost always evidence that neighbors are not effectively cooperating in managing the border and have inconsistent border management strategies. Gavrilis (2008) argues that sharp differences in border management strategy are reflective of different state-building strategies. Our argument is not necessarily inconsistent with this idea. Economic disparities can arise from neighbors pursuing different state-building strategies after becoming states. But our focus is on economic disparities that often reflect recent economic trends and development paths that are not temporally proximate to initial state-building periods. For instance, income disparities between the U.S. and Mexico increased rapidly in the late 1980s and 1990s, after slowly decreasing from the 1950s through the 1980s. We argue that this sharp spike in cross-border income disparity fueled instability and pushed the U.S. to a more militarized border management strategy. Given that the U.S. and Mexico have shared the current border (with some adjustments) since the early 1850s, it is not entirely clear how these trends in cross-border income inequality are related to state-building strategies.

While constructing a wall is a major undertaking, it might be more attractive to leaders than the perceived alternatives. For instance, while it served as a symbol of the interstate rivalry between the United States and Soviet Union, the Berlin Wall was constructed largely as a means of preventing individuals in poorer East Germany from crossing into West Germany in search of better economic opportunities (Gaddis, 2005, 115). More recently, the US government passed the 2006 "Secure Fence Act", which called for "physical infrastructure enhancements" in order to

"achieve and maintain operational control over the entire international land and maritime border of the United States."[7] The bill authorized the construction of a series of fences and walls along the 1,951 mile border between the US and Mexico. The fence, in the words of the Act's House of Representative co-sponsor, Peter King, is to show that "[America] can take meaningful action to secure the border." (quoted in Gamboa 2006).

This leads to our first hypothesis:

Hypothesis 1. *All else equal, as cross-border income inequality increases, so will the probability of a wall along the border between two countries.*

Note that Hypothesis 1 identifies how *changes* in cross-border inequality affect wall construction. Given that we put forward a theory of border stability in which the key independent variable, cross-border inequality, changes across time, it makes sense to focus on within-dyad variation. However, since it is still useful to show that cross-sectional differences in inequality are associated with more unstable borders and wall construction,[8] our analysis will speak to both within-dyad and across-dyad variation.

Alternative Explanations: Civil Wars and Territorial Disputes

While we emphasize the economic determinants of border wall construction, this is surely not the only possible explanation. Thus, we outline alternative logics arising from the extant literature that can explain border wall construction. First, we note how internal conflict, and the instability that often results, can lead neighbors to construct border walls. Two forms of instability that can result from a neighbor's civil war are potential catalysts for wall construction: the flow of refugees fleeing a deteriorated security environment in a neighbor embroiled in civil war (Salehyan and Gleditsch, 2006) and the flow of fighters seeking foreign sanctuary (Salehyan, 2007). Second, we note how states embroiled in territorial disputes with their neighbors sometimes erect defensive

[7]House of Representatives Bill 6061. Available at:
`http://www.gpo.gov/fdsys/pkg/BILLS-109hr6061enr/pdf/BILLS-109hr6061enr.pdf`.

[8]For example, Rosière and Jones (2012) have a cross-sectional focus, as do Hassner and Wittenberg (2015).

walls to blunt their rival's ability to attack, e.g., Israel in the Golan Heights post-1967 (Gibler, 2012; Carter, 2010).

Civil War: Fighters and Refugees

If economic inequalities are driven by conflict induced economic and security deterioration in one state, this can compel a flight to safety in a neighboring state. A refugee is "anyone who flees a country of origin or residence for fear of politically motivated harm" (Salehyan, 2007). Refugees are created by general violence within a country or by direct government persecution. Of course, it is not only civilians that flee a country during civil war. It is also common for rebel fighters to seek sanctuary across borders in neighboring states. Foreign sanctuary is advantageous for rebels, as it raises the difficulty of eliminating them (Salehyan, 2007) and can increase their bargaining power (Bapat, 2007).

A recent spate of bombings along the Turkey-Syrian border vividly captures how civil war in a neighbor can generate negative externalities in the border region. The city of Reyhanli on the Turkish side of the border is home to tens of thousands of both Syrian refugees and opposition fighters, all of whom entered Turkey after civil war erupted in Syria in 2011. A normally quiet community, on May 11, 2013 twin car bombs killed 51 people in Reyhanli. While the ultimate responsibility of the attack was unclear, the locals placed the blame squarely on insurgents from Syria: "The government should never have allowed refugees to live in the towns and least of all so close to the border," said Hasan Ozdemir, editor of a local newspaper whose windows were blown out.[9]

Again, such instability is not necessarily related to disputes over *location* of the border. Instead, it pertains to the *functioning* of the border – if the border is unable to keep out militants wishing to do harm to the local population or use the border region as a base in which to organize violent attacks, then it is a source of instability. This, in turn, often prompts a government response. However, the appropriate response is not obvious. Should the government intervene to stop the violence generating the refugees? Doing so likely will prove very costly in terms of manpower and material. Should the government instead close the border to refugees? If so, how?

[9]Quoted in "An Explosive Border." *The Economist.* May 18, 2013.

Recipient states make a strategic choice between options that are intended to prohibitively increase the costs of migration, such as border wall construction, and direct intervention into their neighbor. Recipients are more likely to build border walls when the sending state is militarily formidable, or they lack intervention/peace-keeping partners. However, if intervention is likely to be both lonely and costly, this will make more attractive aggressive border management strategies such as wall construction.[10]

Simultaneous construction of walls and direct intervention makes little sense, as walls significantly increase the costs of moving troops and supplies across the border. Given the often staggering costs of direct intervention, states affected by conflicts in neighboring states may find it more advantageous to address the symptom (instability from refugee flows) rather than make a very costly attempt to cure the disease (intervene to end or change the character of civil war in its neighbor). This discussion leads to the following hypothesis:

Hypothesis 2. *All else equal, the presence of civil war in a neighboring state increases the probability of a wall at the border.*

Territorial Disputes: Military Threat and Invasion

Scholars have long noted that neighbors seem to be uniquely prone to fighting (Bremer, 1992; Kocs, 1995; Vasquez, 1995; Senese, 2005) and a large body of evidence suggests that territorial disputes between neighbors account for this fact (Vasquez, 1995; Huth, 1996; Hensel, 2000; Huth and Allee, 2002*b*; Senese, 2005). Territorial disputes are found to be good predictors of the outbreak of violence, the duration and intensity of violence, and escalation to war Vasquez (1993); Hensel (2000); Senese (2005). Moreover, recent work by Gibler suggests that the widely replicated 'democratic peace' finding is actually better thought of as a territorial peace (Gibler, 2007; Gibler and Tir, 2010; Gibler, 2012).

Since the presence or absence of territorial disputes is central to whether neighbors' relations are conflictual or peaceful, neighbors with an active territorial dispute naturally experience signif-

[10]Relatedly, Hassner and Wittenberg (2015) find that terrorist attacks are not closely associated with wall-building.

icantly higher levels of external threat (Vasquez, 1993, 1995; Hensel, 2000; Gibler and Tir, 2013). Responding to this threat can take on a variety of forms. For instance, states can maintain high levels of or increase their military spending (Gibler, 2012) or work to form alliances against their rival (Morrow, 1991). While this paper is not the place to review all possibilities, we note that the erection of a physical wall is a possible response that has not received much attention in the extant literature. Physical walls are sometimes defensive structures aimed at blunting potential military offenses from a hostile neighbor (Carter, 2010). The Maginot Line between France and Germany is perhaps the most famous modern example of a wall created for this purpose.[11] In another example, Israel erected a the series of border fences to blunt Syria's ability to attack the Golan Heights following the 1967 War.

Given the centrality of territorial disputes for the outbreak of international conflict, they are also a plausible explanation for the erection of physical walls. Since states embroiled in territorial disputes are at increased risk of military conflagration with their territorial rival, physical walls can be an attractive means of deterring aggression. We assess this idea with the following hypothesis:

Hypothesis 3. *All else equal, territorial disputes between two states increases the probability of a wall at the border.*

3 Research Design

This section describes our procedures for operationalizing two key concepts expressed in our first and primary hypothesis: the presence of border walls and cross-border inequality. This section also describes our procedures for operationalizing the concepts in our hypotheses on alternative mechanisms, as well as variables capturing potentially confounding factors. In the analysis that follows, our unit of analysis is all contiguous state-to-state dyads in the international system.

Measuring Border Walls

We create an original dataset of border walls. To define a wall, we draw on John Keegan's definition of a *strategic defense* (Keegan, 1993, 142). Keegan, focusing on the military purposes of

[11] With the Great Wall of China being the most famous historical example.

fortifications, writes, "[s]trategic defenses may be continuous, as Hadrian's Wall was when kept in repair, or more commonly may comprise individual strongpoints so positioned as to be mutually supporting and to deny avenues of attack to an enemy across a wide front" (Keegan, 1993, 142). Our only modification is to the final clause of the definition: while strategic defense lines can indeed be directed towards denying "avenues of attack to an enemy", they are more broadly intended to prevent entrance by any unwanted entities, be it persons or things (including, of course, a foreign army). Technically, the term "wall" is commonly applied only when there is a "continuous curtain" stretching the length of the strategic barrier, while the term "line" is applied when there is a discontinuous but mutually supporting series of fortifying works, such as fences, ditches, wall segments, and fortresses (Sterling, 2009, 4). For our purposes, we will refer to all strategic defenses as "walls", setting aside the nuances between 'walls' and 'lines'.

Equipped with this definition of walls, we identify walls using a variety of sources.[12] We began with two sources, Sterling's (2009) list of walls and the Global Security Organization's list of "walls, lines, and frontiers."[13] These sources use Keegan's definition of a strategic defense to identify walls, lines, and frontiers. They do not have a precise threshold for how much physical space a wall/barrier must cover. Several stretch for thousands of miles, while others for a few hundred (Sterling, 2009, 4). To be clear, a single checkpoint along a signal road is not a barrier or fence.

We supplement these sources with various encyclopedia entries (for older walls) and news entries (for newer entries). For example, we verified the construction of a wall between Iran and Pakistan using a BBC report[14] and the barrier between India and Bangladesh using a report from the *Atlantic Monthly*.[15] The complete list of barriers is found in Table 1.

While walls are not particularly common, they are also not exceedingly rare. In total, we

[12]We thank Brent Sterling for suggestions of sources.

[13]See `Available at http://www.globalsecurity.org/. Accessed on November 14, 2011.`

[14]BBC News. "World Barriers: Pakistan-Iran" November 5, 2009. available at `http://news.bbc.co.uk/2/hi/south_asia/8343138.stm`

[15]Abigail Cutler. *The Atlantic Monthly.* "Security Fences." March 2005. Available at `http://www.theatlantic.com/magazine/archive/2005/03/security-fences/303734/.`

identify 62 unique instances of man-made physical walls along two state's borders from 1800 to 2014. The longest standing wall is the DMZ separating North and South Korea (58 years), while the average duration of a wall is just shy of two decades (17.5 years). Geographically, walls exist or have existed on each continent, except South America.[16] From a country standpoint, France, the Soviet Union, Saudi Arabia, and Israel have been the most active users of border walls.

Operationalizing Cross-Border Inequality

By cross-border inequality, we mean income inequality. There are several possible ways to measure income inequality across borders. We could, for instance, focus on inequality in just the border regions. However, we avoid doing this for three reasons. First, it is theoretically inappropriate. Our theory deals with the incentives of economic actors throughout a country. While it is more likely that individuals close to the border would attempt illicit cross-border activities, this by no means implies that individuals further from the border will not also find such activities profitable. Thus, we focus on overall income inequality. Second, it is empirically impractical. For example, Buhang and Tollefsen (2011) draw from the Geographically based Economic (G-Econ) Data Research Project (Nordhaus et al., 2006) to look at income levels within provinces and regions of a country. While G-Econ gives province level GDP per capita data for all countries in the world, it does this only for a single year: 1990.[17] Third, focusing on national income levels, rather than just border regions, creates a more conservative test of our theory. By looking at the national level, we are including actors who, due to long distance from the border, face larger transaction costs with respect to illicit cross-border activities. This should bias against finding a relationship between cross-border inequality and the presence of a border wall.

To capture overall income inequality, we use data on GDP per capita in constant 2005 dollars as compiled by Gleditsch (2002). This data is available from 1950 to 2011. We use the Gleditsch

[16]The wall between the USA and Cuba is the wall separating Guantanamo Bay from the rest of Cuba.

[17]In theory, we could use this data to create border province-dyads for all countries in 1990 (i.e. all pairs of provinces that are on two sides of a border). In practice, this would be a fairly large undertaking and, in the end, we would have this for just a single year.

Table 1: State Pairs with Walls, 1800 to 2014 (by Year Constructed)

Country 1	Country 2	Year Contructed	Year Removed
France	Netherlands	1678	1814
Norway	Sweden	1901	1920
Finland	Soviet Union	1920	1939
Soviet Union	Poland	1922	1939
Soviet Union	Estonia	1922	1939
Soviet Union	Latvia	1922	1939
Soviet Union	Lithuania	1922	1939
France	Germany	1930	1940
Greece	Bulgaria	1936	1941
Italy	Yugoslavia	1939	1944
Soviet Union	German Occupied Poland	1940	1944
Finland	Soviet Union	1941	1944
Socialist Republic of Vietnam/Vietnam	China	1946	1979
Soviet Union	Finland	1947	1989
East Germany	West Germany	1947	1989
Czechoslovakia	West Germany	1947	1989
Czechoslovakia	Austria	1947	1989
Bulgaria	Turkey	1947	1989
South Korea	North Korea	1953	.
French Algeria	Morocco	1957	1962
French Algeria	Tunisia	1957	1962
USA	Cuba	1961	.
Zimbabwe (Rhodesia)	Zambia	1966	.
South Vietnam	North Vietnam/Laos	1967	1968
Israel	Egypt	1968	1973
Israel	Syria	1973	.
South Africa	Mozambique	1975	.
India	Bangladesh	1986	.
South Africa	Zimbabwe	1986	.
India	Pakistan	1989	.
Kuwait	Iraq	1991	.
Spain	Morocco (Ceuta)	1993	.
Spain	Morocco (Melilla)	1998	.
Uzbekistan	Kyrgyzstan	1999	.
Israel	Lebanon	2000	.
Uzbekistan	Afghanistan	2001	.
Thailand	Malaysia	2001	.
Turkmenistan	Uzbekistan	2001	.
Botswana	Zimbabwe	2003	.
India	Burma	2003	.
Zimbabwe	Botswana	2003	.
United Arab Emirates	Oman	2004	.
Saudi Arabia	Yemen	2004	.
Brunei	Malaysia	2005	.
Pakistan	Afghanistan	2005	.
USA	Mexico	2005	.
China	North Korea	2006	.
Jordan	Iraq	2006	.
Kazakhstan	Uzbekistan	2006	.
Iran	Pakistan	2007	.
China	North Korea	2007	.
Burma	Bangladesh	2009	.
Saudi Arabia	United Arab Emirates	2009	.
Saudi Arabia	Iraq	2009	.
Saudi Arabia	Oman	2009	.
Saudi Arabia	Qatar	2009	.
Uzbekistan	Kyrgyzstan	2009	.
Kazakhstan	Kyrgyszstan	2010	.
Greece	Turkey	2011	.
Israel	Jordan	2011	.
Iran	Afghanistan	2013	.
Ukraine	Russia	2014	.

data as our main source because it provides the best coverage post-2000. Given that around half of border walls constructed since 1800 have been built since the end of the Cold War, consistently measured data that covers this period was our paramount concern. Results using data compiled by Oneal and Russett (2005) that covers the period 1885–2000 produces similar results, although we cannot measure all of our "controls" or variables associated with alternative hypotheses for this entire period, e.g., territorial disputes. We try numerous specifications of cross-border inequality, most of which we provide as robustness checks in the online appendix. The main measure we use is the ratio of two neighboring states' respective GDP per capita. We have two versions of this measure. The first measure is used in our undirected dyadic tests, and takes the ratio of GDP per capita of the wealthier country over the GDP per capita of the poorer country. Formally, this measure of income inequality is: *Income Inequality*= $\frac{max\{GDPpc_A, GDPpc_B\}}{min\{GDPpc_A, GDPpc_B\}}$, where the A and B subscripts refer to the two (neighboring) countries that share a border. The second is used in our directed dyad tests, and measures the ratio of state A's income per capita over state B's income per capita (even if state B is the wealthier of the two states). This allows us to know if increasing the wealth of state A relative to state B will raise the probability of state A placing a barrier between it and state B. Since both measures are highly right-skewed, we take the natural log each.[18]

Variables to Assess the Alternative Explanations

We now outline the variables used to assess hypotheses 2 and 3. This requires measures of the threat from a civil war in a neighbor (for hypothesis 2) and from a territorial dispute (for hypothesis 3). To assess hypothesis 2, we use an indicator of civil war incidence from the Uppsala Conflict Data Project (UCDP) (Gleditsch et al., 2002). This variable employs the 25 battle deaths per year threshold for civil war and should pick up the presence of serious instability in a neighbor. For our directed dyadic tests, we measure whether their is a civil war in the neighbor of the potential wall-builder. In the dyadic tests, we simply include a measure that indicates whether there is a civil war in either state.

[18]Our key findings do not depend on logging this variable, as we obtain similar results with the unlogged ratio. However, model comparison statistics suggest that the logged measure is more appropriate. See the appendix for details.

Given that one major form of instability that we discuss above involves refugee flows that result from civil war, and the fact that the civil war literature has identified refugee flows as a mechanism that can lead to contagion among neighbors (Salehyan and Gleditsch, 2006), we also include a measure of refugee flows between neighbors in some of our models. We use the logged total of refugee flows between neighbors as recorded in the Population Data Unit of the UN High Commission for Refugees (UNHCR).[19] The UNHCR data contain dyadic records of refugee stocks, with the origin and asylum countries indicated.

To assess hypothesis 3, we code the presence of a territorial dispute between neighbors. We utilize data on inter-state territorial disputes collected by Huth and Allee (2002*b*). Huth and Allee collect data on the population of territorial disputes between 1919 and 1995, data that is updated to 2010 by Huth, Croco and Appel. Additionally, the territorial dispute data contains information on whether the disputed territory contains economically valuable resources, is geographically located in a way that makes it strategically significant, or is deemed of ethnic value by either or both of the disputants. Data on the salient territorial characteristics of disputed territory is available through 2000. Accordingly, we also assess the influence of the characteristics of disputed territory to separate claims that have primarily a security dimension from those that have a prominent economic dimension, although the cost is losing post-2000 observations.

Other Control Variables

A large literature finds a connection between regime type and borders (Mitchell, 2002; Huth and Allee, 2002*b*; James, Park and Choi, 2006; Gibler, 2007, 2012). Accordingly, we also account for ways in which regime type can affect wall construction. In particular, we worry that any support we find for hypothesis 1 might be an artifact of differences in income among democratic and autocratic countries, as the former are known to typically be wealthier than the latter. We develop distinct approaches to the measurement of regime type for our directed dyadic and undirected dyadic tests. In our undirected dyadic tests, we include a variable *mixed dyad* that indicates whether one of the two neighboring states is a democracy and the other a non-democracy. This variable should also measure other differences between autocratic and democratic neighbors, e.g., human rights

[19]This is the same data used by Salehyan and Gleditsch (2006).

practices. We consider a dyad as democratic if both members of the dyad have scores equal to or above 6 on the Polity IV scale that ranges from 10 (liberal democracy) to -10 (authoritarian regime) (Marshall and Jaggers, 2002).[20]

In the directed dyadic models, we include variables that identify the regime type of the potential wall-builder in the dyad. We include three distinct variables: *Autocratic Builder – Democratic Neighbor*, *Democratic Builder – Autocratic Neighbor*, and *Autocratic Dyad*. These variables allow us to identify the effect of each different regime type combination, as the excluded category is a dyad composed of two democracies.

Although we only analyze dyads that share a border, i.e., contiguous dyads, we also account for variation in the extent to which a state's border region is "peripheral." States whose borders are relatively close to the center and the capital, are likely to view border stability more urgently relative to states whose border regions are relatively isolated and far from the capital. Distance is also known to affect the flow of goods across borders (Tinbergen, 1962; Linneman, 1966; Pollins, 1989; Disdier and Head, 2008). Therefore, we include the variable *Log of Distance*, which takes the natural log of the capital-to-capital distance between the two dyad members. Given that this variable does not vary within-dyad, we drop it from the models that include dyad fixed effects.[21]

We also account for the military relationship between the two bordering states. First, we include a measure that indicates whether a pair of neighbors were involved in a militarized interstate dispute (MID) in the prior year. We expect external threat to be higher for states that were entangled in a MID with their neighbor in the prior year. We use dyadic MID data collected by Maoz (2005).[22]

[20]We also try including a measure that indicates whether both states are democracies in our undirected dyadic tests, as a large literature argues that jointly democratic dyads are more peaceful than mixed or autocratic dyads, e.g., Oneal and Russett (1997), and recent work suggests this is closely related to territorial disputes (Gibler, 2007, 2012). We do not include this variable in our main specifications of wall construction as it is not statistically or substantively significant. Given that we control for territorial disputes, this finding is consistent with those of (Gibler, 2012).

[21]Other variables that do not change across time, such as the length of a border are also subsumed by dyad fixed effects. Thus, we do not include them. Note that any other alternative measures, such as the distance of the capital from the border would also be captured by fixed effects.

[22]An incident is coded as a MID when one state makes a threat to use force, a display of force,

Second, we assess the balance of military capabilities between the two states and whether the two states are allies. The variable *Military Capabilities* is the ratio of the two states Correlates of War Composite Index of Military Capabilities (CINC) scores (Singer, Bremer and Stuckey, 1972). We divide the military capabilities of the stronger state by the capabilities of the weaker state to acquire a consistent measure of power balance or imbalance across contiguous dyads. We include the natural log of the capability ratio, as it is highly right-skewed.[23] Given the importance of economic size to military capabilities, it is essential to ensure that our cross-border inequality measure is not a proxy for the balance of military capabilities. Third, formal allies should generally enjoy a better bilateral relationship and be both relatively unlikely to construct a wall or experience conflict. To measure inter-state alliances, we use the Alliance Treaty Obligation and Provision dataset (Leeds et al., 2002). *Allies* is a dichotomous variable equal to one if countries i and j are formally allied and zero otherwise.

4 Empirical Findings

First Look at the Data

Before employing regression analysis, we examine the raw data to see if simple statistical evidence supports our theory. Table 2a compares the rate of wall existence between states with differences in income inequality that are above (High GDP Per Capita Difference) or below (Low GDP Per Capita Difference) the mean value of **cross-border inequality**. Table 2a shows that dyads with GDP Per Capita ratio above the mean value – which is a rather conservative measure of "high inequality" – produces a rate of wall presence that is 20 percent higher than the rate of wall presence for dyads with below median ratios in GDP Per Capita. This is consistent with our primary hypothesis that high cross-border income inequality is associated with border walls. Table 2b shows the relationship between differences in GDP per capita and the presence of a wall when the threshold for a "high" GDP per capita ratio is set to the 75th percentile (3.18). Table 2b shows that dyads with GDP Per Capita ratios above the 75th percentile produces a rate of wall presence that is over 94% percent

uses force, or initiates a war against another state.

[23] An unlogged version of this variable performs quite similarly.

higher than the rate of wall presence for dyads with ratios of GDP Per Capita that are below this threshold. This is again consistent with our primary hypothesis that high cross-border income inequality leads to border walls.

Table 2: Cross-Border Income Inequality and Presence of Wall

(a) Median as Cutpoint

	GDP per Capita Ratio	
	High	Low
Percentage of Observations with Wall	0.024 N=13,413	0.020 N=13,414

(b) 75th Percentile as Cutpoint

	High	Low
Percentage of Observations with Wall	0.035 N= 6,707	0.018 N= 20,120

Note: Difference in top table is statistically significant at the 0.95 confidence interval in a two-sided t-test, while difference in bottom table is statistically significant at the 0.99 confidence interval in a two-sided t-test.

Multivariate Results

The above cross-tabulations are suggestive, but the correlations may be driven by confounding variables. Moreover, the above cross tabulations fail to account for the alternative hypotheses. Multivariate analysis helps us to address these concerns. We use logit regression models with dyadic fixed effects, random effects, no dyadic specific effects to assess whether inequality is associated with the presence of a wall. Practically speaking, the inclusion of dyad specific fixed effects ensure that the effects and statistical significance of a variable are the result of within-dyad variation, rather than cross-dyad variation. However, fixed effects cannot be estimated for dyads in which there is no temporal variation in the outcome variable. Thus, observations in which there is never a wall are dropped (King, 2001). A random effects logit provides a straightforward alternative that still attempts to capture unobserved heterogeneity between groups, but does so without removing observations with no variation in the dependent variable (King, 2001; Rabe-Hesketh and Skrondal, 2008). Unlike the fixed effects model, a random effects model does impose the assumption of exogeneity between the observed covariates and the dyad specific intercept, as the intercept is not

included as binary variables, but is instead subsumed into the error term. We present estimates from both models to allay reader concerns about either approach. Table 3 contains nine models of the presence of a wall.[24]

All of our model specifications show that income inequality is strongly associated with wall construction. First, we assess our arguments with dyadic data, analyzing a dependent variable that measures whether a wall is built and maintained at the border of two contiguous states. We then conduct a series of tests to further detail the mechanism driving wall construction. We claim that walls are a strategy primarily for wealthier states to prevent illicit flows of goods and people from a poorer state. While cross-national data on illicit cross-border activity is limited (if not completely unavailable), we can leverage the directionality of our theory and the fact that our data does identify the state that constructed the wall. Therefore, our primary series of tests have the directed-dyad as the unit of analysis, meaning, for example, that the United States-Mexico dyad is distinct from the Mexico-United States dyad. This allows us to identify how the above described variables impact whether the first state listed in each directed dyad constructs a wall along the border with the second state in the dyad.

Table 3 contains estimates from nine different model specifications. The models differ in how they measure territorial disputes, as well as whether they include additional variables related to the alternative hypotheses that focus on inter-state conflict and cross-border civil war. Note that inclusion of these additional variables carries a cost in terms of the sample size, as we have the disaggregated data on territorial disputes and the refugee flows data through 2000. Given that there are 14 border walls between 2001 and 2006, we also report the results without these variables. We also focus on the variables with coverage through 2006 in our directed dyadic tests in table 4, although the results are similar either way. For each specification (in terms of regressors), we

[24]A Hausman test comparing model I (without the distance variable) and model II rejects the null hypothesis of no systematic difference in the coefficients between a random effects and fixed effects models. We obtain a p-value of 0.000. However, we suspect that this is due, not to systematic differences in the cross-border inequality variable, but the territorial dispute variable (as the signs are flipped on this variable's coefficient). If we exclude the territorial dispute variable, we now fail to reject the null hypothesis with a p-value of 1

estimate a model with dyadic fixed effects, random effects as well as a pooled model. Thus, the models leverage variation within dyads across time, i.e., the fixed effects models, as well as variation across all dyads in the sample, i.e., the pooled models. The advantage of the fixed and random effects models is that they identify how within-dyad changes across time are associated with wall building. This empirical strategy allows us to say something about why the U.S. built a wall at its border with Mexico in 2005, but not in the 1970s. In contrast, the key advantage of the pooled specification relative to a fixed effects model is that it allows us to explicitly compare dyads, such as the U.S.-Mexico and the U.S.-Canada. Thus, in the fixed effects model we expect increasing cross-border income inequality across time to predict wall-building, while in the pooled model we expect dyads with greater levels of cross-border inequality to be at higher risk of wall-building. The within-dyad test is a more difficult one, as most any variables in international relations vary more across a large sample of dyads than within a particular dyad across time.

Our hypothesis that cross-border economic inequality is a significant driver of wall construction finds support across all model specifications in table 3.[25] Thus, as the level of economic inequality increases within a particular dyad across time, the probability of a wall being built increases significantly. This is the result regardless of whether we estimate a dyad fixed effects model and lose nearly 95% of our observations, or whether we estimate dyad-specific random effects. The coefficient for the our income inequality variable is consistently positive and significant across all fixed and random effects specifications, which provides support for hypothesis 1. The results of the models without dyad specific effects also provide consistent support for the idea that neighbors with higher than average levels of cross-border economic inequality are significantly more likely to build a wall than a contiguous dyad with average levels of cross-border inequality.[26] Thus, we find that cross-border economic inequality is a consistently significant predictor of border walls, regardless of whether we identify within-dyad or across-dyad variation.

Figure 1 depicts the extent to which increasing cross-border inequality influences the probability

[25]Note that we also tried a variety of alternative measures and arrived at similar results. Please see the supplemental appendix for the results using other measures.

[26]The dyad with a value of cross-border economic inequality closest to the sample mean across all dyads is France and Switzerland in 1960.

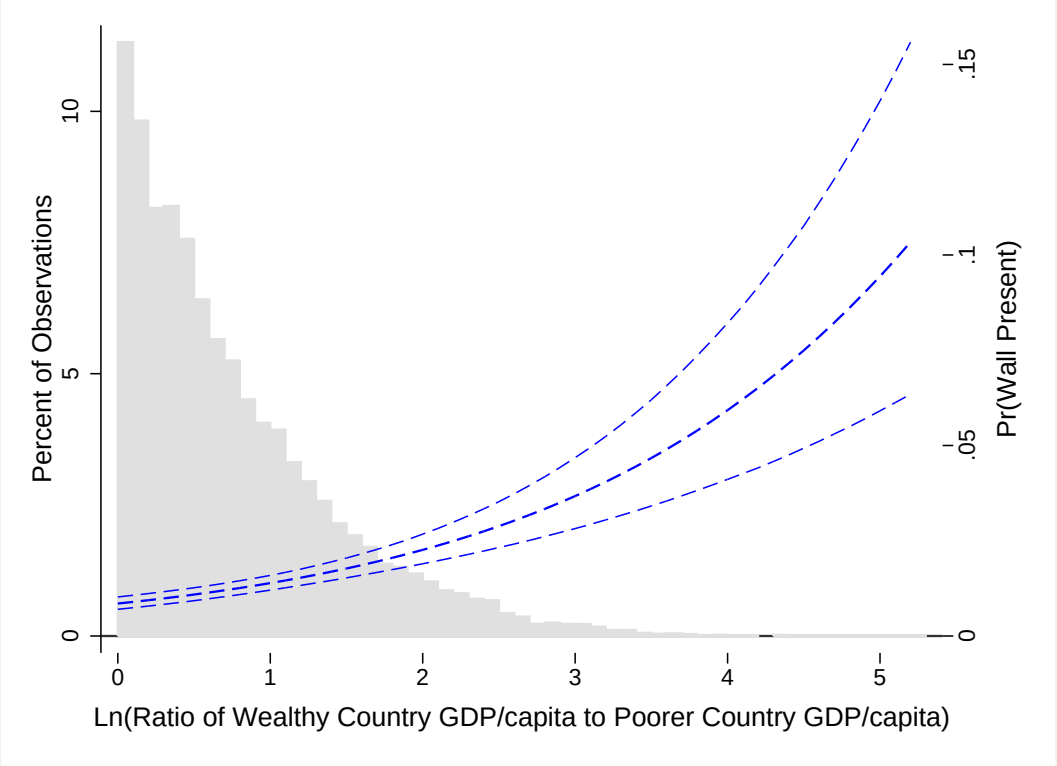
Table 3: Cross-Border Income Inequality and Physical Wall Emergence

	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model VIII	Model IX
Income Inequality	0.89**	0.97**	0.49**	2.52**	3.14**	0.52**	2.68**	3.39**	0.56**
	(0.17)	(0.19)	(0.06)	(0.39)	(0.68)	(0.07)	(0.49)	(0.80)	(0.07)
Territorial Dispute	0.16	-0.20	1.96**				-0.77*	-0.95**	1.25**
	(0.29)	(0.30)	(0.09)				(0.40)	(0.45)	(0.12)
Territorial Dispute – Strategic Location				0.27	0.28	2.47**			
				(0.41)	(0.48)	(0.15)			
Territorial Dispute – Economic Value				-0.25	-0.36	0.44			
				(0.39)	(0.42)	(0.13)			
Territorial Dispute – Ethnic Value				1.84**	0.91	0.20			
				(0.56)	(0.75)	(0.15)			
Mixed Dyad	1.23**	1.22**	1.09**	1.25**	1.11**	1.29**	1.51**	1.40**	1.41**
	(0.23)	(0.25)	(0.10)	(0.29)	(0.32)	(0.12)	(0.33)	(0.37)	(0.12)
Allies	0.17	0.21	-0.53**	-0.39	-0.37	-0.13	-0.84**	-0.83**	-0.19
	(0.20)	(0.20)	(0.10)	(0.30)	(0.35)	(0.12)	(0.36)	(0.41)	(0.13)
Ratio of Military Capabilities	-0.79**	-1.04**	-0.12**	0.40**	0.70**	0.04	0.47**	0.85**	0.05
	(0.20)	(0.22)	(0.03)	(0.16)	(0.34)	(0.03)	(0.18)	(0.36)	(0.03)
MID_{t-1}							0.14	0.04	0.90**
							(0.32)	(0.33)	(0.15)
Civil War	-0.74**	-0.84**	-0.07	-0.40	-0.50*	-0.20	-0.76**	-0.82	-0.31**
	(0.22)	(0.23)	(0.10)	(0.26)	(0.28)	(0.13)	(0.31)	(0.32)	(0.14)
Log Refugee Flows							0.28	0.30	-0.14
							(0.20)	(0.22)	(0.11)
Log of Distance	-0.53		-0.62**	-2.19**		-0.49**	-2.12**		-0.42**
	(0.39)		(0.04)	(0.43)		(0.04)	(0.36)		(0.05)
Constant	-12.83**		-1.08**	-8.60**		-1.87**	-9.85**		-2.40**
	(2.69)		(0.23)	(3.03)		(0.23)	(2.62)		(0.27)
Dyad Fixed Effects	No	Yes	No	No	Yes	No	No	Yes	No
Dyad Random Effects	Yes	No	No	Yes	Yes	No	Yes	No	No
Years	1950–2006	1950–2006	1950–2006	1950–2000	1950–2000	1950–2000	1950–2000	1950–2000	1950–2000
N =	26,209	1,517	26,209	19,315	775	19,315	17,896	521	17,896

Standard errors in parentheses
** $p < .05$; * $p < .10$

of wall presence (along with the distribution of cross-border inequality). One can see that, holding all other variables at their mean values (or their modes if binary), the probability of a wall rises from almost 0 percent when the natural log of the GDP ratio is near its smallest values to over 10 percent when the natural log of the GDP ratio is near its largest values. While a small percentage of the total observations are located on the far right hand side of the graph, there are still a fair number of observations at these higher values. More precisely, 40 observations have values above 4 and over 300 observations with values above 3. Most importantly, the rather tight confidence intervals suggests that increasing the ratio has a statistically significant effect on the probability of a wall being present. For example, increasing the natural log of the GDP ratio from its mean value (0.76) to 50 percent above its mean value (1.14) raises the probability of a wall being present by 11 percent, while an increase of 100 percent above its mean value raises the probability of a wall being present by 20 percent.

Figure 1: Cross-Border Inequality and Probability of a Wall.



Note: Computed using Model 3 of Table 3. All other variables set to mean values.

We find little support for the idea that when one of two neighboring states in a dyad is fighting

in a civil war, that this is positively associated with building a wall. In fact, we estimate negative coefficients in all models, although the coefficient is sporadically significant. We will provide an additional and more direct test of this hypothesis in our directed dyadic models. Following Salehyan and Gleditsch (2006) in models VII–IX we also investigate whether the negative externalities that civil war creates for neighbors results from refugee flows. However, we do not find any support for the idea that a higher number of refugee flows are associated with building walls. Rather, the coefficient on the log of refugee flows is never statistically significant. The sign and significance of this variable is unaffected if we exclude the civil war variable, only measure refugee flows from countries experiencing civil war, or measure refugee flows differently, e.g., unlogged.

Territorial disputes are not consistently found to be a factor pushing states to build walls. Only when we pool all dyads (i.e., models with no fixed or random effects) do we we find support for territorial disputes being associated with wall-building. This is reflective of the within-dyad presence of territorial disputes varying less over time than the across-dyad presence of territorial disputes. These results suggest that the kind of instability that leads to wall construction is often distinct from territorial disputes. In a broader sense, this is consistent with Gavrilis (2008), who argues that instability in border management (i.e., border function) is often not tied to whether there is a dispute over border location. In fact, three of our models suggest that dyads which experience a territorial dispute at some point are *less likely* to erect a border wall when the dispute is ongoing, although the coefficient is not statistically significant in model II. Thus, while territorial disputes are clearly dangerous and a well-known source of military escalation (Vasquez, 1993, 1995; Hensel, 2000; Vasquez, 2000; Senese, 2005), dyads that experience them are no more likely to erect a wall during the dispute then before the dispute starts or after the dispute is resolved. When we disaggregate territorial disputes in Models IV–VI, we see that this insignificant coefficient is not driven by disputes over territory with particular characteristics. Specifically, if we disaggregate territorial disputes into disputes over economically valuable territory, disputes over territory with strategic value, and disputes over territory with ethnic importance, we find no consistent relationship with states' building physical walls at the border. We find that borders that split an ethnic group are more likely to see wall building in the random effects specification, i.e., model IV, but this is not a finding that survives fixed effects or a pooled model. In contrast, the pooled model, i.e., model

VI, shows a positive significant relationship between strategic territory and wall-building, a finding that is not robust to the inclusion of either fixed or random effects.

The results on a few of the control variables are worth highlighting. We find some support for the MIDs variable, as it is positive in all models and significant in the pooled specification. The inconsistent findings for the ratio of military capabilities across all specifications further suggests that walls are not a straightforward function of potential threat from a neighbor's superior military capabilities. The idea that formal allies should be less likely to build walls also finds inconsistent support. The allies variable has a negative sign in all but two models and is only negative and statistically significant in three models. We find much support for the idea that neighbors with different regime types have a propensity to build walls at their shared boundary.[27] The mixed dyad variable, which indicates whether a dyad is composed of a democracy and non-democracy, is positive and statistically significant in all models.[28] We also find consistent support for the idea that neighbors with capital cities that are farther away from each other are significantly less likely to build walls, as the log of distance between capitals is negative and statistically significant in all but one of our random effects models.[29]

Who Built the Wall? Directed Dyadic Tests

Now that we have used an undirected dyadic approach to establish that cross-border income inequality is a consistent predictor of a wall emerging between neighbors, we turn to a directed dyadic approach. The directed dyad approach is the most theoretically salient as it clearly identifies which of two bordering states built a wall at the border. Thus, it provides a more direct test of whether the wealthier state built a wall in a dyad with high income inequality, or if a state with a neighbor embroiled in civil war built a wall.

[27]If we include a democratic dyad variable or autocratic dyad variable, neither consistently exerts much effect.

[28]In our directed dyadic tests, which we discuss below, we disaggregate this variable to identify the regime type of the wall-builder and the neighbor.

[29]We do not include this variable in our fixed effects specifications, as it is time-invariant within dyad.

Table 4 shows the results of the directed dyadic models. In Models I–III, the dependent variable is a binary variable coded as 1 if there is a wall present between states A and B in year t, zero otherwise. The three models differ in specification as Model I includes fixed effects, Model II random effects, while Model III is a pooled model with no dyadic specific effects. In Models IV–VI, the dependent variable is a binary variable coded as 1 if state A constructs a wall between it and state B in year t, zero otherwise. After the year a state builds a wall at its border with a neighbor, that directed dyad drops out of the sample unless the wall is deconstructed, as this dependent variable measures the *initial* erection of a border wall. As in Models I–III, we estimate a model with fixed effects, random effects and a pooled model with no dyadic effects. The pooled models with no dyadic specific effects, i.e., Model III and VI, make comparisons across all dyads. Thus, while the fixed effects specifications, i.e., Models II and IV, identify how within-dyad variation across time affects wall presence and creation, Models III and VI identify each coefficient by comparing the value of each variable to the mean for a given variable across all dyads.[30]

The key independent variable in table 4 is *Directed Income Inequality*. Recall that this variable captures how the income per capita of the first country in each directed dyad, i.e., the potential builder of a wall, compares to the income per capita of the second country in each directed dyad. The positive coefficients on *Directed Income Inequality* shows that increasing the wealth of state A relative to state B increases the probability of state A having a wall present (Models I–III) or state A constructing a wall between it and state B in a given year (Models IV–VI). This is the case even in the fixed effects models, where the sample size is substantially reduced. Substantively, using Model IV, we find that increasing the income inequality of state A relative to state B from its mean value (0.74) to 50 percent above its mean value will increase the probability of state A constructing a wall by 34 percent. In fact, *Directed Income Inequality* is the only variable that exerts a consistently significant effect across all specifications in table 4. This is striking as table 4 includes models of two different dependent variables where we estimate fixed effects, random effects, and a pooled model for each. Thus, regardless of whether we focus on the maintenance of a wall or on the initial building of a wall, income inequality is the most consistent predictor of border

[30]Model VI is a rare events logit model, as the fact that the initial creation of a wall is a very rare event suggests this approach. However, results are similar with an ordinary logit model.

Table 4: Cross-Border Income Inequality and Walls, Directed Dyad Tests

	Wall Presence			Wall Creation		
	Model I	Model II	Model III	Model IV	Model V	Model VI
Directed Income Inequality	0.87**	0.86**	0.70**	0.86**	1.47**	0.84**
	(0.08)	(0.07)	(0.07)	(0.27)	(0.37)	(0.23)
Democratic Builder	0.83**	0.76**	1.40**	1.86**	0.77	1.74**
-Autocratic Neighbor	(0.20)	(0.21)	(0.13)	(0.67)	(0.84)	(0.67)
Autocratic Builder	-0.43*	-0.55**	0.71**	1.23*	-1.33	1.15
- Democratic Neighbor	(0.24)	(0.25)	(0.14)	(0.71)	(0.93)	(0.74)
Autocratic Dyad	0.02	-0.10	0.42**	1.22*	-0.48	1.10
	(0.24)	(0.26)	(0.13)	(0.66)	(1.01)	(0.68)
Log of Distance	-0.24	.	-0.56**	-0.56**	.	-0.42**
	(0.27)	.	(0.04)	(0.20)	.	(0.16)
Allies	0.29**	0.28*	-0.31**	0.09	1.01*	0.10
	(0.15)	(0.15)	(0.09)	(0.36)	(0.60)	(0.39)
Capability Ratio	-0.55**	-0.61**	0.0001	-0.02	-1.15*	-0.01
	(0.11)	(0.17)	(0.03)	(0.14)	(0.66)	(0.10)
Neighbor Civil War	-1.33**	-1.35**	-0.52**	0.32	-0.19	0.36
	(0.19)	(0.19)	(0.14)	(0.42)	(0.53)	(0.43)
Territorial Dispute	0.37*	0.24	1.84**	1.91**	1.76**	1.92**
	(0.20)	(0.22)	(0.09)	(0.36)	(0.78)	(0.36)
Constant	-13.89**		-1.46**	-6.18**		-5.90**
	(1.92)		(0.23)	(1.51)		(1.20)
Dyad Fixed Effects	No	Yes	No	No	Yes	No
Dyad Random Effects	Yes	No	No	Yes	No	No
N =	52,420	3,100	52,420	51,525	2,165	51,525

Standard errors in parentheses
** $p < .05$; * $p < .10$

walls. This is true whether we focus on within-dyad variation in income inequality, i.e., Models II or IV, or if we compare across all contiguous dyads, i.e., Models III or VI.

We find mixed support for the alternative hypotheses in the directed dyad models. The presence of a civil war in a neighboring state is not a consistent predictor of a state building a physical wall.[31] Contrary to expectations, the civil war variable is statistically significant and *negative* in models I–III, which are the models of wall presence. Thus, walls appear less likely to be present in dyads when a neighbor experiences civil war than when it does not, regardless of whether we focus on within-dyad or across-dyad variation. This might reflect that intense violence and instability created by a neighbor's civil war too drastically increases the costs of building and maintaining a wall, which might also explain the lack of a finding for the refugees variable.[32]

Territorial disputes have a more consistent and expected effect on wall presence and creation relative to what we found in table 3. We find fairly consistent evidence that territorial disputes positively affect both wall presence and creation. The lone exception is the fixed effects model of wall presence. Thus, it seems that when dyads have a territorial dispute, they are significantly more likely to create a wall, although the presence of a dispute is not a great predictor of whether the wall remains in place or not. These results provide more support for hypothesis 3, and suggest that there are two main routes to the creation of walls, an economic route and a security route. However, we hasten to note that we find support for income inequality across all six models in table 4, as well as all nine models in table 3 and a large number of additional specifications reported in the appendix. Thus, an economic logic does seem to be a better predictor of physical border walls.

We briefly discuss the results on the remaining variables. The distance between capitols measure is negative and significant in all relevant models, same as in table 3. The coefficients on the variables for the dyad members being allies and measuring the capability ratio of the dyad members are sporadically significant, although generally in the same direction as the coefficients in table 3. Most notable are the coefficients on the regime type variables. The directed dyadic approach facilitates investigation of how distinctions in the regime type of the potential builder and its

[31]The refugees variable is not significant in any of the models, so we do not include it here.

[32]A variable that measures the presence of a civil war in the potential wall building state performs similarly.

neighbor influence the building of walls at the border. Accordingly, we divide the joint regime type variable into three distinct variables: *Democratic Builder - Autocratic Neighbor*, *Autocratic Builder - Democratic Neighbor*, and *Autocratic Dyad*. The coefficients on all three variables are compared to dyads where both states are democratic. This allows us to identify why mixed dyads are associated with wall building in table 3. The results suggest that democratic states are especially likely to build walls when their neighbors are autocratic. The coefficient on *Democratic Builder - Autocratic Neighbor* is significant and positive in all models except model V, the fixed effects model of wall creation. We find weak evidence suggesting that autocratic dyads are more likely than democratic dyads to build walls. Pooling all dyads, we find that walls are more likely in autocratic dyads, a result that only reappears in the random effects model of wall creation, i.e., model IV. Finally, the findings for autocratic builders that face democratic neighbors are mixed and inconclusive: we find a negative and significant coefficient in model II, positive and significant coefficients in models III and IV, and insignificant coefficients in all other models.

Overall, table 4 shows *Directed Income Inequality* to have a consistently positive and statistically significant influence on walls. However, the directed dyadic models do suggest that territorial disputes are also important for wall creation.

Endogeneity Tests

Since a wall inhibits labor mobility, one may suspect that the presence of a wall contributes to economic disparity (rather than or in addition to economic disparity leading to the wall). To account for such a possibility, we adopt several approaches. None of these approaches, whose results are reported in an online appendix, suggests that our findings are driven by endogeneity.

First, we simply reestimate our results by applying progressively longer lags to the cross-border economic inequality variable. Our results remain the same (both substantively and statistically) when we apply 1 year, 5 year, or 10 year lags. Second, we estimate several models of economic growth in countries that are poorer in comparison to at least one of their neighbors. These models include either a lagged indicator for whether there is a wall present or an indicator for how long the wall has been in place. None of these tests find a relationship between walls and economic growth.

Third, we estimate a simultaneous equations model (Keshk, Pollins and Reuveny, 2004), where

one model uses the presence of a wall as the dependent variable and uses cross-border economic inequality as the independent variable, while the other model uses cross-border economic inequality as the dependent variable and the presence of a wall as the key independent variable.[33] This approach shows that the presence of a wall does increase income inequality, but also shows that increasing cross-border economic inequality continues to have a large and positive impact on the probability of a wall.

5 Conclusion

The stability of shared borders and strategies for managing border function are of critical theoretical and practical importance to both policy-makers and scholars. We explored a particularly aggressive strategy of border management: walls. Our central argument is that cross-border economic inequality creates incentives for individuals to take part in illicit economic activity that generates economic and security externalities. Disparities in economic conditions across a border influence the border's effectiveness as an institution. Borders that separate economies with very different levels of development are likely to be unstable. This instability is associated with a significantly higher probability of wall construction. We provide considerable evidence for our argument using newly collected data on human-made walls separating states from 1800–2014. Cross-border economic inequality is consistently found to be a core predictor of wall presence and construction.

Our findings have numerous important implications for literatures in international relations and comparative politics. First, the striking finding that over 50% of border walls built in the last two centuries were built in the post-Cold War era suggests that unilateral and aggressive border management strategies are on the rise in the "age of globalization". Our findings strongly suggest that borders remain both relevant and contentious despite increases in the volume of goods and people moving across them. In fact, the border wall trend suggests that aggressive border management strategies are on the rise *because* of the increases in the volume of goods and people moving across them. The finding that cross-border economic inequality is the most robust predictor of border walls suggests that these post-Cold War walls have less to do with traditional security

[33]To satisfy the exclusion restriction of the simultaneous model, the model predicting the difference in GDP per capita contains the lag of GDP per capita.

issues and fortification against rival states than with fortification against unwanted immigration and illicit trade. While we have identified broad trends, much work remains for scholars of comparative political economy to investigate how inequality in different economic factors, e.g., unemployment versus wages, affects border management strategies.

Relatedly, much work remains for conflict scholars to investigate a wider range of border management and security policies and how they relate to economic and security factors. We focus on a relatively severe form of unilateral boundary management, but a wide range of less severe and less costly tactics remain to be studied. For instance, states often attempt to increase border patrol efforts prior to taking the relatively costly step of building a physical wall. The United States began construction of a border wall along wide stretches of the U.S.-Mexico border in 2005, while militarization of border management more generally began in the mid to late-1990s (See Andreas 2000 for details).

An obvious next step for this project is to investigate the effects of border walls. States build walls to curb the unwanted flow of people and goods across the border. However, there is no systematic study to our knowledge that investigates whether this is an effective strategy. Data limitations likely make this a difficult area to study cross-nationally, but examination of a particular border with "micro-level" data might be a fruitful way to investigate this important issue. In his interesting study, Gavrilis (2008), suggests that unilateral and aggressive border management strategies such as wall-building will be ineffective. We agree with Gavrilis and suspect that walls might generate new problems. Because walls increase the difficulty and cost of crossing the border, they may actually heighten the demand for "professional" smugglers, or organizations with the capacity to skirt controls and find means of entry. Thus, harsh security measures can create a more robust market for well organized, funded, and often armed traffickers of humans and goods. This could lead to further security crackdowns at the border, increasing the chances of violent confrontations. Consequently, harsh measures increase the prominence of (often violent) organizations that specialize in trafficking at the border and increase the probability of armed clashes between these organizations and state security forces. The increased incidence of armed conflict at the border, even if primarily between non-state organizations and the security forces of one or the other state, also increases the risk of an armed clash between the two states' security forces, even if accidental.

The border between the U.S. and Mexico provides a good illustration of how a harsh security crackdown empowers actors with a vested interest in continued border instability. Peter Andreas notes that "the intensified border control campaign has transformed the once relatively simple act of crossing the border into a more complex system of illegal practices (Andreas, 2000, 95)." In fact, although individuals once crossed the border independently without too much trouble, by the late 1990s almost 75% of individuals illegally crossing the border did so with the "services of a smuggler" (Andreas, 2000, 95).[34] Miguel Vallina, a Border Patrol Chief in San Diego, makes the point quite succinctly: "[t]he more difficult the crossing, the better the business for smugglers (quoted in Andreas 2000, 97)." In sum, unless by "good fences" we quite unrealistically mean "perfect fences" that almost completely curtail unwanted cross-border movement, "good fences" may not make good neighbors.

[34]This figure comes from a binational study on migration between the U.S. and Mexico.

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